

REMARKS

The Examiner is thanked for his careful and very thorough Office Action.

Claims 1-3 and 5-30 have been rejected. By the foregoing amendments, various claims are sought to be amended or canceled without prejudice.

The amendments to Claims 1, 5, 13, 19, 22, and 28 are not intended to be substantive and are being amended for clarification purposes.

The foregoing amendments to the specification are submitted to improve clarity, and to remove various typographical and other minor informalities. These changes are respectfully asserted not to introduce new matter, and their entry is respectfully requested.

Rejections Under 35 USC 112, first paragraph

The Examiner has suggested that the limitation of, "wherein said determination is made without the use of an error term or per pixel decisions" is not supported by the specification. Applicant would like to direct the Examiner's attention to following sections of the present application:

Anti-aliased lines have two conflicting requirements: speed and quality. For high speed (or low gate cost) the number of sub-pixel samples needs to be kept low, but for high quality the more sub pixel samples the better. A single fixed pattern of samples is usually chosen for all lines. This has the disadvantage that a given pattern will lead to varying quality across lines of different orientations. For example, a given pattern may generate good quality for vertical lines, but lead to lower quality for horizontal lines.

All lines can be classified as x-major or y-major depending whether the x or y

extent of the line is larger. A given fixed pattern will normally generate inferior quality for one or other of these line types. One way to fix this is to take more sample points, but this compromises the performance requirements...

FIG. 1 shows an example of using different sampling patterns for x- and y-major lines. Each sample pattern has four sub-pixel points. Four is chosen as this gives good performance. In the case of the x-major line 102, using a vertical sampling pattern (black dots) shows 2 samples being covered by the line, giving 50% coverage of the pixel. This is a reasonable approximation. For the same line 102 a horizontal sampling pattern (grey dots) gives us no coverage which is incorrect. Similarly, for the y-major line 104, the vertical sampling pattern (black dots) incorrectly gives 100% coverage whereas the horizontal pattern (grey dots) gives reasonably accurate coverage of 75%.¹

Of course, this text in the specification does not define the scope or interpretation of any of the claims, which speak for themselves.

As stated in the cited sections above, we are making a decision PER LINE; the prior art is not. We are determining an attribute, i.e. the classification, of the line itself. This new technique for rendering antialiased lines does not require calculations made on a pixel-by-pixel basis or the use of an error term. This allows for fast and economical antialiased rendering with superior anti-aliased results for all lines.

¹ Paragraphs [0023] to [0026].

The Examiner also appears to express concern over negative limitations. Applicant respectfully submits that such concern is no longer warranted as negative limitations have been determined to be acceptable for quite some time now. Even the MPEP devotes an entire section to negative limitations:

2173.05(i) Negative Limitations

The current view of the courts is that there is nothing inherently ambiguous or uncertain about a negative limitation. So long as the boundaries of the patent protection sought are set forth definitely, albeit negatively, the claim complies with the requirements of 35 U.S.C. 112, second paragraph. ...

*Note that a lack of literal basis in the specification for a negative limitation may **not** be sufficient to establish a prima facie case for lack of descriptive support. ...(emphasis added by Applicant)*

Applicant respectfully submits that the boundaries of the patent protection sought are set forth definitely and that there is sufficient support in the present application. Accordingly, Applicant respectfully requests withdrawal of this rejection.

Art Rejections

The art rejections are all respectfully traversed.

Rejections Under 35 USC 102(b)

Claims 1-3 and 5-8 stand rejected under 35 USC Section 102(b) as anticipated by *Wong et al.*

Wong et al. relates to a method or apparatus for providing video graphics that includes anti-aliasing. As noted by the Examiner, *Wong et al.* requires pixel by pixel calculations and the use an error term and threshold value to determine which direction is most parallel to the line being rendered.

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The present application does not require the use of pixel by pixel calculations or the use of an error term or threshold value. This leads to **increased visual quality of the line without adding in more sample points.**

The claim language of amended Claim 1 is not met. Specifically, amended Claim 1 now recites, **"for each respective line, determining which of a plurality of orientation classes that entire line falls into."** As stated earlier, *Wong et al.* makes a PIXEL-BY-PIXEL determination. In contrast, the present inventions make a LINE-BY-LINE determination. This allows for fast and economical antialiased rendering with superior anti-aliased results for all lines.

Claim 1 also recites, **"wherein said determination is made without the use of an error term or per pixel decisions."** As noted by the Examiner, *Wong et al.* determines which orientation class the line falls into by edge walking and using an error term and threshold value.

Claim 5 also recites features not shown or suggested by *Wong et al.* Specifically, amended Claim 5 now recites, **"identifying, for at least one respective entire line, which one of a limited number of directions is most nearly parallel to said line."**

Again, the present inventions make a decision PER LINE; *Wong et al.* does not.

Claim 5 also recites, **"wherein said identification is made without the use of an error term or per pixel decisions."**

Again, the Examiner has noted that *Wong et al.* determines which orientation class the line falls into by edge walking and using an error term and threshold value.

Dependent Claims 2-3 and 6-8 depend directly from independent Claims 1 and 5 and incorporate all the limitations thereof.

Thus, for the reasons discussed above, Applicant respectfully requests withdrawal of this rejection.

Conclusion

This amendment is being submitted in response to the Final Office Action dated 02/23/2004 and, therefore, could not have been submitted earlier. Its entry is respectfully requested. All grounds of rejection and/or objection are traversed or accommodated, and favorable reconsideration and allowance are respectfully requested.

Respectfully submitted,



N. Elizabeth Pham, Reg.No. 49,042

Customer Number 29106

Attorney for Applicant

11330 Valley Dale Drive, Dallas TX 75230

214-363-3038 groover@technopatents.com May 24, 2004